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Pat. Dkt. No. APPM4215Y1/CMP/CMP/RKK
PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of:
Sun et al.

Serial No.: 09/645,690

Filed: August 24, 2000

For: CU CMP POLISHING PAD
CLEANING§§ Group Art Unit: 1746
§§
§§ Examiner: Alexander Markoff
§§
§§ Confirmation No.: 4428MAIL STOP: AMENDMENT
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450CERTIFICATE OF FACSIMILE
TRANSMISSION UNDER 37 CFR 1.8

I hereby certify that this correspondence and the documents referred to as attached therein are being facsimile transmitted to the U.S. Patent and Trademark Office to the fax number indicated by the Examiner, namely, fax number 571-273-8300 to the attention of the named Examiner, on the date below.

5/8/06
Date
SignatureDECLARATION UNDER 37 C.F.R. § 1.131

The undersigned inventor, Lihong Sun, hereby declare as follows:

1. That I am a co-inventor of the above referenced patent application.
2. Attached is an invention alert (Exhibit A) dated prior to August 7, 2000, disclosing improvement of cleaning a CMP polishing pad by using a pad cleaning composition. All masked dates in Exhibit A are prior to August 7, 2000. Confidential information not relevant to the invention date of the present application is also masked.
3. That Exhibit A describes a method for cleaning a polishing pad surface subsequent to CMP a wafer surface containing copper or a copper-based alloy using a pad cleaning composition and the method was conceived prior to August 7, 2000.
4. In view of Exhibit A and the above statements, the invention of pending claims 1-18, 26-31 and 33 was conceived prior to August 7, 2000, and filed with due diligence prior to August 7, 2000, to the filing of the patent application on August 24, 2000.

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5. The undersigned, Lizhong Sun, hereby declares that all statements made herein of my own knowledge are true and that these statements made on information and belief are believed to be true and further that these statements were made with knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of this application or any patent resulting therefrom.

09/27/05
Date

L. Y. S.
Lizhong Sun

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INVENTION ALERT FORM**0004215**

TO: Gaile Bailey M/S 2061
 Extension: 32724
 Current Date: 6/04/06

ALERT NO: _____

6/04/06**CIRCLE ONLY ONE FROM EACH TOP SECTION:**

1) OWNER 2) DIVISION 3) PRODUCT BUSINESS GROUP(PBG)

PLEASE SUBMIT ONE ORIGINAL, SIGNED DOCUMENT FOR RECORDING. IF THIS IS A COPY
 OF A PREVIOUSLY SUBMITTED ALERT, PLEASE MARK IT ACCORDINGLY

EPI	KPU1	METAL	ATD	IBSS	CORE TEC	PRP	COPPER	ACVD	OPAL	AMIL
ORION	KPU3	SILICON	CORP		MICRO		PLUG	APVD	ORBOT	
OXDL	KPU8	HDP			CORE ENG		LINER/ BARRIER	AETCH	NPD	
AIT	PSI	MXP&RPS			PROCOMP		BASELINE	AHRDWR	ITC	
CAP	CMP	COM ENG			CORE KNO		ECD/CU			
	LOWK	HEXODE								
	HIGH K	SMO								

Please use separate attachments for any answers that don't fit on the form, especially for questions 3-8. If the answer to a question is "NONE", please write "NONE" rather than leaving the answer blank.

1. Title of Invention (please print clearly):

A PAD CLEANING SOLUTION FOR METAL CMP

2. Inventors-Names only-(please print clearly and provide complete information)

Lizhong Sun, Shijian Li, and Fritz Redeker

3. Earliest dates and model names of all Applied products incorporating the invention which have been offered for sale or are expected to be offered for sale:

Commonly, slurries or fixed abrasive solutions in metal CMP consists of complexing agents and inhibitors. During polishing, these components react with removed metal and form some polish by-products, which deposit onto polish pads and accumulate colored stain or glazed area. This can significantly affect a polish removal rate, result in unstable processes, and cause scratches on wafer surface. Usually, pad conditioning with Nylion brushes or diamond disks is used for removing the deposited bi-products from pads. However, this kind of conditioning can not completely remove the deposition. With increasing polishing time, the deposition still accumulates. Therefore, the conditioning with brushes and diamond or ceramic disks can just partially clean the pad. In this work, an efficient pad cleaning solution

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6/04/06

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for metal CMP was invented, which is able to efficiently remove the bi-product from polish pads and keep the pad clean.

4. If the invention has been demonstrated or described to persons other than Applied employees, for each disclosure please provide the earliest date, name of company, a brief description of what was disclosed and the purpose of the disclosure. Attach a copy of any related non-disclosure agreements:

None

5. If future disclosures like those in Question #4 are expected to occur within the next 12 months, please provide the anticipated date, type of information to be disclosed, and purpose of the disclosure: NONE [x]

6. Describe any other known designs or processes, whether actually implemented or merely proposed in a publication, which could be considered similar to your invention or which constitute the state-of-the-art improved upon by your invention. If described in a publication, attach a copy of the same or provide a citation.

Unkown

7. List each feature of the invention, which you consider novel and non-obvious. Describe the advantages of each novel feature in comparison with the state-of-the-art approaches, which are most similar to your invention:

Pad-glazing problem due to the deposition of polish bi-products on polish pads causes a low removal rate, an unstable process, and scratches on wafer surface. Conventional conditioning methods (brush and diamond or ceramics disks) can only partially remove them from pads. In this invention, a chemical solution was applied onto a rotating polish pad with a flowrate of 100 – 200 ml/min for 3 - 8 s after each wafer was polished. Then, high-pressure DI water was spread on the pad for 5 - 12 s to clean the solution. The pad kept as clean as a new pad throughout its lifetime.

8. Describe the invention, preferably with reference to attached drawings:

In this work, a pad cleaning solution for copper CMP was invented. The solution contains following components:

- a. An organic compound with amine or amide group(s), such as ethylenediamine, with concentration from 0.2 v/v% to 3 v/v%;
- b. An acid, such as phosphoric acid, acetic acid, and sulfuric acid to adjust pH of the solution to a range from 3.0 to 10.0;
- c. DI water for the rest

ATTACH ADDITIONAL SHEETS TO DESCRIBE INVENTION AS NEEDED

9. Provide the following information for EACH inventor:

Inventor #1:		
Name:	<u>Lizhong Sun</u>	Employee # <u>[CONF.]</u> Mail Stop <u>1512</u>
Work Phone	<u>[CONF.]</u>	
Job Title:	<u>Member of Technical Staff</u>	
Citizenship	<u>P. R. of China</u>	
Home Address	<u>[CONF.]</u>	
Manager:	<u>Shijian Li</u>	Title: <u>Manager, Advanced Technology</u>
Div. Manager	<u>Fritz Redeker</u>	Title: <u>Senior Director of Technology</u>
Product Group:	<u>CMP</u>	Dept #: <u>2893</u>

Inventor #1:		
Name:	<u>Shijian Li</u>	Employee # <u>[CONF.]</u> Mail Stop <u>1512</u>
Work Phone	<u>[CONF.]</u>	
Job Title:	<u>Senior Member of Technical Staff / Leader of Advanced Technology</u>	
Citizenship	<u>P. R. of China</u>	
Home Address	<u>[CONF.]</u>	
Manager:	<u>Fritz Redeker</u>	Title: <u>Senior Director of Technology</u>
Div. Manager	<u>Chris Smith / John White</u>	Title: <u>General Manager</u>
Product Group:	<u>CMP</u>	Dept #: <u>2893</u>

Inventor #4:		
Name:	<u>Fritz Redeker</u>	Employee # <u>[CONF.]</u> Mail Stop <u>1512</u>
Work Phone	<u>[CONF.]</u>	
Job Title:	<u>Senior Director of CMP Technology</u>	
Citizenship:	<u>U.S.A.</u>	
Home Address:	<u>[CONF.]</u>	
Manager:	<u>Chris Smith / John White</u>	Title: <u>General Manager</u>
Div. Manager:	<u>Tom St. Dennis</u>	Title: <u>President PDD</u>
Product Group:	<u>PDD</u>	Dept #: <u>1399</u>

FOR ADDITIONAL INVENTORS, PLEASE COMPLETE AND ATTACH ADDITIONAL SHEET AS NEEDED.

ADDITIONAL INVENTORS:

<u>Inventor #4:</u>		
Name:	Employee #	Mail Stop
Work Phone	Fax No.:	
Job Title:		
Citizenship		
Home Address		
Manager:	Title:	
Div. Manager	Title:	
Product Group:	Dept #:	

<u>Inventor #5:</u>		
Name:	Employee #	Mail Stop
Work Phone	Fax No.:	
Job Title:		
Citizenship		
Home Address		
Manager:	Title:	
Div. Manager	Title:	
Product Group:	Dept #:	

<u>Inventor #6:</u>		
Name:	Employee #	Mail Stop
Work Phone	Fax No.:	
Job Title:		
Citizenship		
Home Address		
Manager:	Title:	
Div. Manager	Title:	
Product Group:	Dept #:	

10. Signature, date and **PRINTED** name of each inventor plus two witnesses who have read and understood this Invention Alert form:

Inventors:

_____ Printed Name	_____ Date	_____ Signature
_____ Printed Name	_____ Date	_____ Signature
_____ Printed Name	_____ Date	_____ Signature
_____ Printed Name	_____ Date	_____ Signature
_____ Printed Name	_____ Date	_____ Signature
_____ Printed Name	_____ Date	_____ Signature

Witness:

_____ Printed Name	_____ Date	_____ Signature
_____ Printed Name	_____ Date	_____ Signature

Return to: Gaile Bailey
Mail Stop: _____
Fax No. : _____
Extension: _____